



### Core Focus

- Division involving decimal fractions: dividing a decimal — or dollars and cents — by a one- or two-digit divisor
- Introducing the coordinate plane and plotting ordered pairs
- Recognizing relationships in numeric patterns and plotting these ordered pairs
- Using the coordinate plane in solving problems
- Creating, describing and interpreting scatterplots

### Multiplication with Common Fractions

- In this module, students develop a broad and deep understanding of division involving **decimal fractions**. Money is used as the context in all of the lessons.
- The module stresses the importance of estimation and checking the sensibility of the answers. The partial-quotient strategy is used to help establish that there are two parts — dollars and cents that are divided.

10.1

**Step In** Estimating to Solve Division Problems

Four friends shared the cost of this gift.  
About how much money should each person pay?

\$10 is not enough and \$15 is too much.  
The amount that each person pays must be somewhere between these two amounts.

In this lesson, students use the estimation strategy to help solve division problems.

- Dividends can be split into parts to make the division easier. An example is splitting the dividend 32.80 into a whole number (32) and a decimal part (0.80) because both parts are easily divisible by 4 (as shown in the Glossary).

10.2

**Step In** Using Partial Quotients with Decimal Fractions

How can you split the cost of this meal equally among four people?

You could break \$24.20 into dollars and cents. This diagram makes the division easier.

\$5	\$1	5¢
\$5	\$1	5¢
\$5	\$1	5¢
\$5	\$1	5¢

How much is each person's share?  
What fraction of one dollar is one cent?  
How would you write that as a decimal fraction?  
What fraction of one dollar is five cents?  
How would you write that as a decimal fraction?

Complete this diagram to show how you could break up \$36.60 to divide by 6.  
What is the answer?

\$36.60 ÷ 6
÷ 6
÷ 6

This lesson continues the development of a division strategy that supports both mental and written methods.

- The work with division is extended to involve greater amounts of money and examples where the division process must be carried to the hundredths place. The students also work with two-digit divisors.

### Ideas for Home

- Restaurant menus provide a great opportunity for your child to practice decimal fraction operations. Ask them to find the total price of two or three items (reinforcing decimal fraction addition), then find the cost per person if the items are shared by 2 or 3 people (division). There may be a few cents left over.

### Glossary

- ▶ **Decimal fractions** are fractions in which the denominator is 10, 100, or 1000, etc., but are always written using decimal points.
- ▶ A **decimal point** indicates which digit is in the ones place. It is positioned immediately to the right of the ones digit.
- ▶ An **algorithm** is a rule used for completing tasks or solving problems.

$$\begin{aligned} 32.80 \div 4 \\ (32 \div 4) + (0.80 \div 4) \\ 8 + 0.20 = 8.20 \end{aligned}$$

$$\begin{aligned} 46.90 \div 7 \\ (42 + 4.90) \div 7 \\ (42 \div 7) + (4.90 \div 7) \\ 6 + 0.7 = 6.7 \end{aligned}$$

**10.6** **Step In Solving Division Problems (One- and Two-Digit Divisors)**

Wendell's college books cost \$379.20. He made equal payments over one year to pay for the books.

About how much should he have paid each month?  
How would you figure out the exact amount?

Lily changed the decimal fraction to a whole number. She thought:

$$37920 \div 12$$

$$36,000 \div 12 = 3,000$$

$$1,200 \div 12 = 100$$

$$720 \div 12 = 60$$

$$\underline{\quad\quad\quad} 3,160$$

$$3,160 \div 100 = 31.60$$

Abel used the standard division algorithm. He thought:

$$\begin{array}{r} 31.60 \\ 12 \overline{) 379.20} \\ \underline{-36} \phantom{0} \\ 19 \phantom{0} \\ \underline{-12} \phantom{0} \\ 72 \\ \underline{-72} \\ 0 \end{array}$$



In this lesson, students apply a standard algorithm for dividing decimal fractions, connecting the written method to the strategies they have learned.

**Algebra – Ordered Pairs**

- Students begin by learning about the coordinate plane — a rectangular grid on which they graph ordered pairs (x, y) of numbers.
- Students find patterns among pairs of numbers and use this to solve problems. These lessons focus on additive and multiplicative patterns and are important preparation for future algebra study.

**10.9** **Step In Working with Different Representations of Patterns**

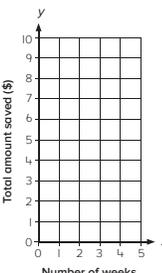
Veronica plans to save \$2 each week. How could she show the total amount she has saved at the end of each week?

She could use a table or ordered pairs. She could even show it on a coordinate plane.

Complete the table and list of ordered pairs. Then graph them on the coordinate plane.

Number of Weeks	1	2	3	4
Total Amount Saved (\$)	2	4		

(1, 2) (2, 4) (3, ) (4, )



In this lesson, students identify relationships between numerical patterns and graph the ordered pairs of related numbers.

**Data – Scatterplots**

- Students are also introduced to scatterplots. Students analyze scatterplots and try to match them to real world investigations.

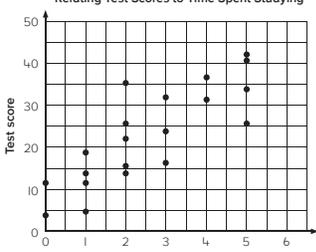
**10.11** **Step In Introducing Scatterplots**

Scatterplots are often used to show a relationship between two sets of measurements.

What are the two measurements being related in this scatterplot?

Each student is represented by one blue dot.

Relating Test Scores to Time Spent Studying



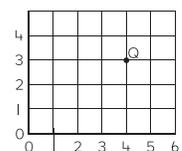
In this lesson, students record measurements on scatterplots and describe their thinking about the relationship between the results displayed.

**Ideas for Home**

- Many road or city maps use ordered pairs to name locations (often a letter and a numeral). Practice finding locations by first moving horizontally and then moving vertically.
- Some everyday examples of number patterns can be found in cooking ( $\frac{2}{3}$  cup of water to 1 cup of pancake mix,  $1\frac{1}{3}$  cups of water to 2 cups of pancake mix, and so on) and shopping (three items on sale for \$2.00, six items on sale for \$4.00 and so on). Look for other examples with your child.

**Glossary**

- ▶ A **coordinate plane** is a rectangular grid which has a horizontal axis called the x-axis and a vertical axis called the y-axis. The origin is where the axes meet.
- ▶ An **ordered pair** is two numbers that describe a specific point on a coordinate plane. These numbers are called coordinates. Marking ordered pairs on a coordinate plane is called graphing or plotting.
- ▶ A **scatterplot** is used to show the relationship between pairs of data. The pairs are displayed as points not connected by lines.



The ordered pair for point Q on the coordinate plane is (4,3).